

DEPT. OF TRANSPORTATION
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March 28, 2007

Tim Smyth, Senior Propulsion Engineer, FAA
Chicago Aircraft Certification Office.
Propulsion Branch, ACE-118C,
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E-mail: timothy.smyth@faa.gov

RE: Navion Fuel Systems.- N91472

Dear Tim:

Thank you for answering my e-mail asking if you were still there, and our subsequent rather long telcon about the Navion Fuel Systems. I'm glad I had the chance to understand what is happening from the FAA point of view, and your insight into what is going on at Sierra Hotel Arrow (SHA).

I'm pretty disturbed by the terms of SB 106, in that it lumps owners who skimp on aircraft maintenance together with those who try to do it right. It assumes that because there have been two recent crashes which may have involved faulty fuel systems, that there is a need to force a wholesale replacement of fuel valves because that is the alternative to expensive annual testing. And, there is no assurance that the new valves will work any better than a properly maintained old one.

I purchased my aircraft, Navion N91472, in May 1991, and was immediately forced into a wholesale overhaul in order to make this aircraft airworthy. Included, among other things, was an engine overhaul (by Pacific Continental Engines), demating the fuselage from the wing, separation of the wings, and removal and repair of the leaking wing tanks. By the time all this work was done, I had spent more in maintenance in less than a year, than I did to purchase the aircraft.

One of the items we attended to was the overhaul of the fuel selector valve. While the valve did not leak air into the fuel lines, it did permit fuel to drain from the right tip tank into the mains while the valve was in the "off" position. Upon disassembly, we found that the "O"-rings sealing each port on the valve body were old, hard, cracked and portions were missing. We obtained the Hoof Products Company Service Bulletin for the Model A73V valve, and followed their procedures and specifications for o-rings in servicing the unit. Since the first overhaul in 1992, I have had the valve overhauled twice more, to assure that the o-rings do not deteriorate to the condition I found them in when we purchased the aircraft.

The Hoof valve was installed with the tip tanks in 1973 by Bob Douthitt in El Centro CA. A review of the Aircraft Maintenance Log from that date until my purchase in 1991 indicates the valve was overhauled in 1975, and then not subsequently until my purchase in 1991, a period of about 16 years.. I am informed by Joel Thomburg, of the Imperial Valley Navioneers, that he too has a Hoof 4-way valve in his aircraft, and that this valve was certified for use in Piper 260's which had 4 wing tanks with separate feeds.

In my Annual Inspection currently being completed, we completed the procedures included in SB106, and found that there was no suction leak in either the gascolator or fuel selector valve. I fail to

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understand why I should have to disconnect these lines and vacuum test these pieces of equipment on an annual basis, but that if I were to purchase the SHA valve, such inspection would not be required.

I participated in the original restorative work on N91472 performed by Ted Aronson at Rosamond, CA., in 1991 and 1992, and I have participated in each Annual Inspection thereafter, in order to be as knowledgeable about the aircraft as an engineer could be. I am a Registered Civil Engineer in the State of California, and my practice involved design of roads and traffic appurtenances, including traffic signs and signals. These latter devices were continually subject to vibration due to wind loads, and helped me understand the effects of vibration on aircraft systems. Although not previously experienced in aeronautical engineering, I consider myself fully capable of understanding issues where safety may be compromised. Certainly, the introduction of air into the fuel feed system is a matter of concern. Fortunately, through my efforts to assure my safety in flight, we have taken reasonable steps to repair or replace any system that compromises safety in flight over the years. I am not the type to hand an airplane over to an A&P and then wait for the completion of the annual, and I am known for bringing my aircraft into an A&P for analysis and repair when I feel that a safety issue is questionable.

That having been said, it appears to me that:

- (1) If there are continuing problems with certain brands of fuel selector valves installed in Navions or other GA aircraft, then these valves should be specifically called out for intensive observation.
- (2) If a vacuum or pressure test on a valve fails, and there exists a factory service bulletin providing overhaul and testing instructions, then there should be NO requirement to replace that valve unless testing procedures fail after the prescribed overhaul.
- (3) If a valve is determined to be unserviceable, an owner should be able to purchase ANY certified valve with the properly configured (2, 3, or 4-port) valve body, rather than only the valve selected by the Type Certificate Holder, since there appear to be better valves than the Andair on the market, and SHA does not provide a 4-port valve for replacement at this time.
- (4) If an A&P/IA determines that there is no notation of fuel system maintenance in the aircraft maintenance logbook over the past 5 years, then compliance with a system check should be required. Any recorded continual fuel system maintenance and/or inspection should exempt the owner from compliance with Service Bulletin 106 or any resulting AD. A simple signoff by an A&P/IA should indicate compliance with this exemption.
- (5) It appears to me that some aircraft owners will always pay attention to maintenance details such as this issue raises, and some will continue to minimize their maintenance efforts to the detriment of their safety. And some owners will continue to ignore placards requiring use of main tanks for take-off and landing. No continuing issuance of more AD's trying to improve the condition of aircraft will prevent numbskulled pilots from making such mistakes, and then blaming the equipment rather than their own errors in flying the airplane.

I am enclosing the information provided by Hoof Products Manufacturing Co, which we use in the inspection and overhaul of my fuel selector valve. I would appreciate it if you could assist me in developing a reasonable AMOC for any AD which might be issued pursuant to SB 106.

Thanks, Tim, for listening! Please call or email me with any comments you deem appropriate.



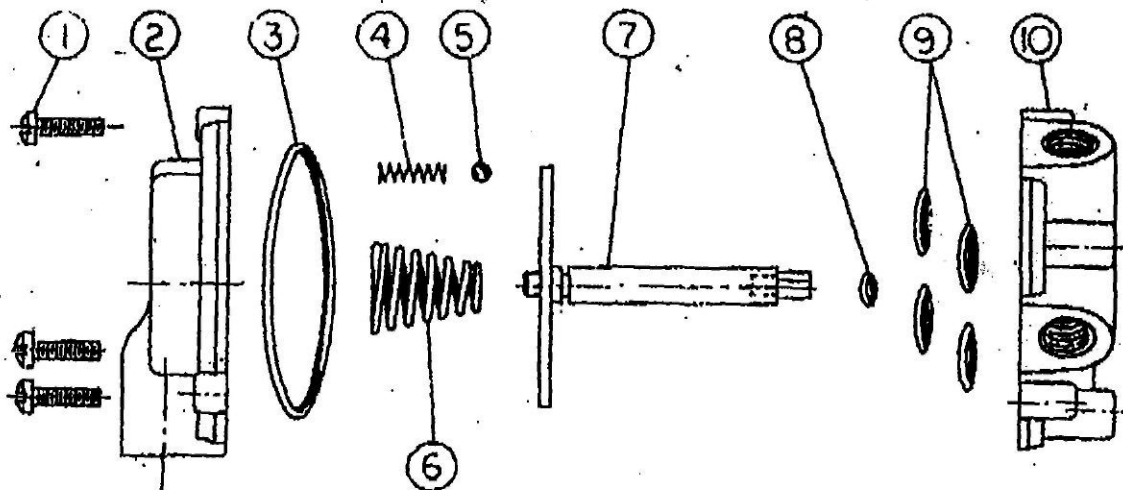
Maynard Keith Franklin
N91472@aol.com

Hoof Products Company

SERVICE BULLETIN

Model A73V and A73 W
Fuel Selector Valves

Post-It™ brand fax transmittal memo 7671		# of pages >
To	KEITH FRANKS	
From	DAN McDONALD	
Co.	Co.	
Dept.	Phone #	
Fax #	Fax #	

SERVICE PARTS

Item	Part No.	Part Name	Req.	Item	Part No.	Part Name	Req.
1	A114-224	Screw	3	7	A104-354	Valve Assem. for A73W	1
2	A101-491	Cover	1		A104-380	Valve Assem. for A73V	1
3	A106-504	"O" Ring	1	8	A106-506	"O" Ring	1
4	A110-129	Spring	1	9	A106-520	"O" Ring	4
5	A134-10	Ball	1	10	A101-490	Body	1
6	A110-130	Spring	1				

OVERHAUL PROCEDURE

Remove the three screws (1) and carefully separate the Cover (2) from Body (10). Remove Valve Assembly (7) from Body (10). Remove all "O" Rings.

Clean all parts in a cleaning solvent, Federal Specification F-3-661. Inspect all parts for wear or damage, and replace as required. Replace "O" Rings (3), (8), and (9).

Re-assemble the valve, packing the "O" Rings with "Petrolatum".

TEST PROCEDURE

Rotate the control shaft through two complete turns clockwise and through two complete turns counter-clockwise. There should be no binding.

At each port position, there should be a positive "feel" stop. Turn the valve to the "off" position and pressure test each port with 20 psi air to check for leaks. Submerge the valve in Odorless Mineral Spirits to detect air leaks. There should be no leakage, external or internal.

USED ON - A70

A73

A73-TR

MATERIAL - Buna N - To Conform To Drawing MS29513-14B

SPECIFICATION MIL-P-3315A

HYDROCARBON FUEL RESISTANT (-65 TO +160 °F)

NOMINAL SIZE: 2 3/4 x 2 15/16 x 3/32

MANUFACTURER AND "O" RING IDENTIFICATION MARKS IN

ACCORDANCE WITH QPL-5315-13 (OR LATEST REVISION).

CERTIFICATION REQUIRED WITH ALL "O" RINGS PURCHASED.

Post-It™ brand fax transmittal memo 7671 # of pages = 3	
To: Keith	From: DAN
Co:	Co:
Dept:	Phone #
Fax #	Fax #

LIMITS ON DELIVERABLES

± 1/2" REMOVE ALL BURRS

MATERIAL

HOOF PRODUCTS COMPANY
6843 E. LARAMIE AVE. CHICAGO, ILL. U.S.A.

NAME

"O" RING

PART NUMBER

A106-504

RECKAWN-RELEASE

CA 196

REVISION

DATE

BY

USED ON
 A70
 A73
 A73-TR
 A79
 A89

MATERIAL - BUNA N - TO CONFORM TO DRAWING MS 29513-10

SPECIFICATION MIL-P-5315A

HYDROCARBON FUEL RESISTANT (-65 To +160 °F)

NOMINAL SIZE: $\frac{1}{4} \times \frac{3}{8} \times \frac{1}{16}$

MANUFACTURER AND "O" RING IDENTIFICATION MARKS IN
 ACCORDANCE WITH QPL-5315-13 (OR LATEST REVISION.)

CERTIFICATION REQUIRED WITH ALL "O" RINGS PURCHASED.

LIMITS ON DECIMALS $\pm .005$

LIMITS ON FRACTIONS $\pm .010$

ANGLES $\pm 1/2^\circ$

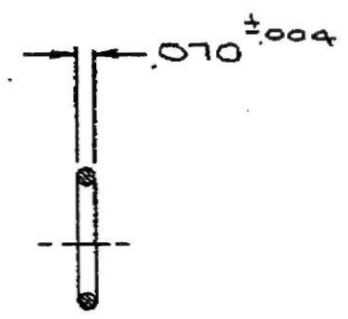
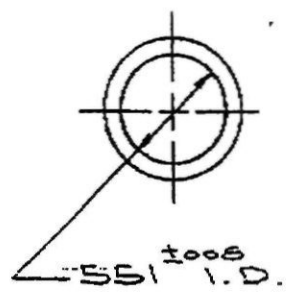
REMOVE ALL BURRS

		MATERIAL		HOOF PRODUCTS COMPANY 6543 S. LARAMIE AVE. CHICAGO, ILL. U.S.A.	
DATE	REV.	REVISION		NAME "O" RING	PART NUMBER
0-19-60	A	REDRAWN - RELEASE EN 196		DATE 0-19-60	A106-506
				DRAWN <i>Bank</i>	SCALE

10/22/1992 12:05 HOOF PROD. MAG., IA. 319 6526806 P.03

USED ON: A73V
A73W
A73TE3

TOTAL P.03



PARKER VITON "O" RING
SIZE 2-15
COMPOUND: 77-545
DUROMETER: 72
TENSILE STRENGTH: 2160 PSI

NOTE:
THIS PART SUPERSEDES PART NO A106-505

LIMITS ON DECIMALS $\pm .005$ LIMITS ON FRACTIONS $\pm .010$ ANGLES $\pm 1/2^\circ$ REMOVE ALL BURRS

		MATERIAL		HOOF PRODUCTS COMPANY	
		NOTED		6543 E. LARAMIE AVE. CHICAGO, ILL. U. S. A.	
11-14-61 (A) RELEASED CN #290				NAME "O" RING	
DATE SYN. REVISION				PART NUMBER	
				A106-520	
				DATE 11-13-61 DRAWN BY [signature] APP. [signature] SCALE 1/2	